Rayleigh Wave Group Velocity Dispersion Across Northern Africa and the Middle East

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The vast tectonically complex region of Northern Africa and the Middle East is poorly understood due to a lack of sampling relative to similar size regions throughout the world. Using regional and teleseismic Rayleigh waves, traversing the region, we are able to obtain three-dimensional shear velocity structure by computing group velocity as a function of period. Individual path Rayleigh wave group velocity dispersion curves, in the period range of 10-150 sec, are then inverted using backprojection tomography. Rayleigh waves in the period range are most sensitive to the shear velocity structure of the lithosphere. Preliminary results suggest significant lateral heterogeneity of the crust and upper mantle. Results from this study help constrain the regional tectonics of the area and will also be used to better define the seismic characteristics required to verify a nuclear test ban treaty.

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